

Installation, Operation and Maintenance

VA(M)S24-70-(T) -T Series Actuator

SUPERSEDES: New

EFFECTIVE: September 30, 2016

Plant ID No. 001-4270

IMPORTANT:

Use this VA(M)S-70-(T)-T Series Electric Spring Return Actuator only to control equipment under normal operating conditions. Where failure or malfunction of the electric actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the electric actuator.

Installation:

Install the ball valve with the actuator at or above the center line of the horizontal piping (see Figure 1).

IMPORTANT:

Before specifying VA(M)S-70-(T)-T Series Electric Spring Return Valve Actuators for plenum applications, verify acceptance of exposed plastic materials in plenum areas with the local building authority. Building codes for plenum requirements vary by location. Some local building authorities accept compliance to UL 1995, Heating and Cooling Equipment, while others use different acceptance criteria.

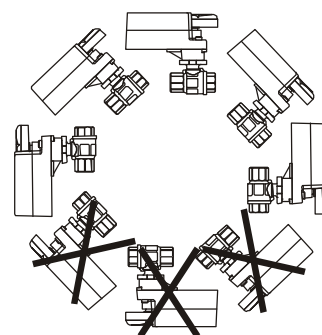


Figure 1: Mounting Positions for Chilled Water and Condensing Atmosphere Applications

IMPORTANT:

Do not install or use this VA(M)S-70-(T)-T Series Electric Spring Return Valve Actuator in or near environments where corrosive substances or vapors could be present. Exposure of the actuator to corrosive environments may damage the device's internal components, and will void the warranty.

Special Tools Needed

- Commissioning Tool or digital voltmeter
- T-20 TORX® driver

Dimensions:

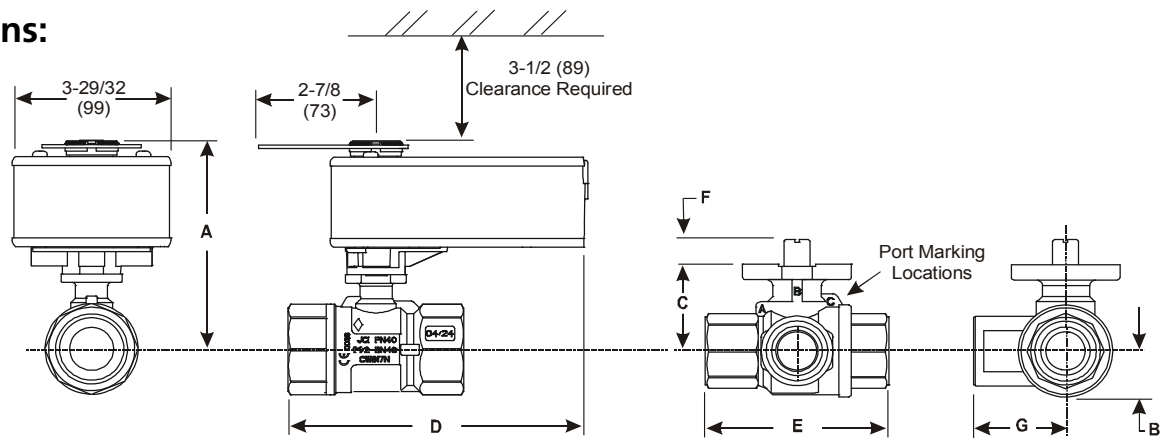


Figure 2: Spring Return VA(M)S-70-(T)-T Series Ball Valves - Dimensions, in. (mm)

VA(M)S-70-(T)-T Series Ball Valve Ball Valve Dimensions, in. (mm)

Valve Size in. (DN)	Valve Style ¹	A	B	C	D	E	F	G
1-1/4 (DN32)	All	5-5/32 (131)	1-1/32 (26)	1-23/32 (44)	7-1/4 (184)	3-15/16 (100)	11/32 (9)	1-31/32 (50)
1-1/2 (DN40)	All	5-5/16 (135)	1-9/64 (29)	1-57/64 (48)	7-7/16 (189)	4-21/64 (110)	11/32 (9)	2-11/64 (55)
2 (DN50)	2-Way	5-17/32 (140)	1-15/32 (37)	2-1/8 (54)	7-11/16 (195)	4-27/320 (132)	11/32 (9)	2-27/64 (62)
	3-Way				7-7/8 (200)			

1. Port A must always be connected the coil (Figure 2).

Mounting

Mounting the Actuator to Spring Return Port A (Coil) Open

To mount the actuator to Spring Return Port A (Coil) open:

1. Turn the valve stem to the position outlined in Figure 4.

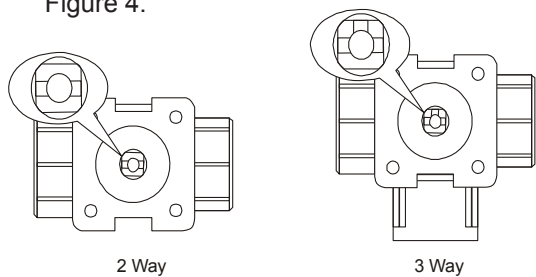


Figure 4: Positioning the Valve Stem

Note: Proceed to Step 7 if the ball valve linkage is on actuator Side B.

2. Remove the linkage from Side A (Figure 5).

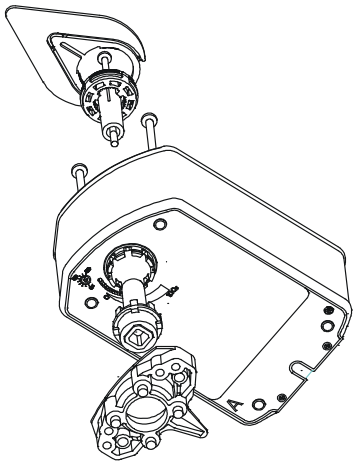
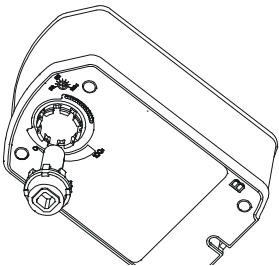


Figure 5: Removing the Linkage

3. Insert the drive shaft into Side B (Figure 6).



4. Install linkage base on Side B using the two #10-14 x 2.75 in. long screws (Figure 7). The recommended torque is 20 to 24 lb-in. (2.3 to 2.7 N·m).

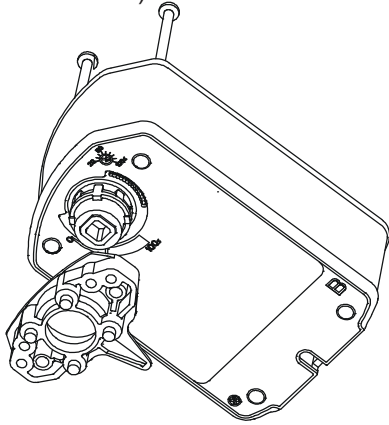


Figure 7: Installing the Linkage

5. Insert fixed pointer and M4x0.7x83 mm long screw into the Side A actuator hub. Direct the arrow on the pointer to 100%.

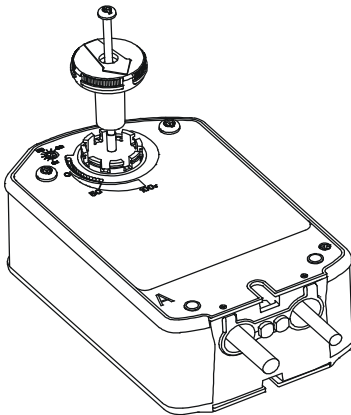


Figure 8: Installing the Fixed Pointer

6. Install the actuator on the ball valve (Figure 9). Tighten the actuator mounting screw to a torque of 10 to 12 lb-in. (1.1 to 1.4 N·m) and snap in the large adjustable pointer into place.

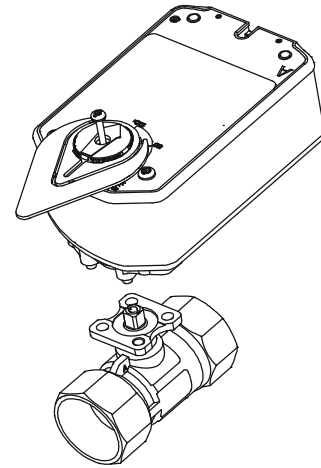


Figure 9: Mount the Actuator

Mounting the Actuator to Spring Return Port A (Coil) Closed

To mount the actuator to spring return port A (coil) closed:

1. Turn the valve stem to the position outlined in Figure 10.

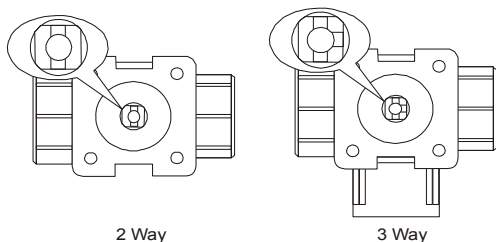


Figure 10: Positioning the Valve Stem

Note: Proceed to Step 7 if the ball valve linkage is on actuator Side A.

3. Remove the linkage from Side B (Figure 11).

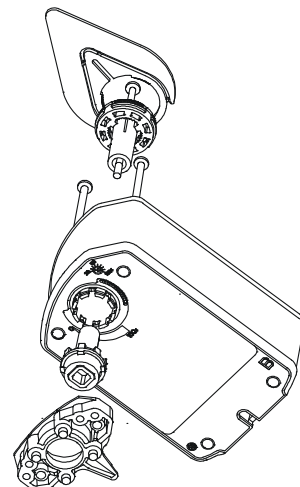


Figure 11: Removing the Linkage

4. Insert the drive shaft into Side A (Figure 12).

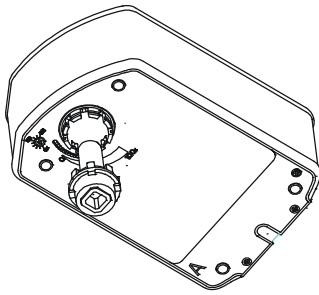


Figure 12: Inserting the Drive Shaft

5. Install linkage base on Side A using the two #10 14 x 2.75 in. long screws. The recommended torque is 20 to 24 lb·in. (2.3 to 2.7 N·m).
6. Insert fixed pointer and M4x0.7x83 mm long screw into the Side B actuator hub. Direct the arrow on the pointer to 0% (Figure 14).

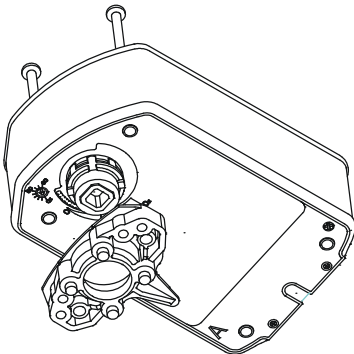


Figure 13: Installing the Linkage

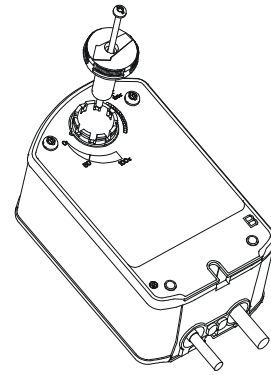


Figure 14: Installing the Fixed Pointer

7. Install the actuator on the ball valve (Figure 15). Tighten the actuator mounting screw to a torque of 10 to 12 lb·in. (1.1 to 1.4 N·m) and snap the large adjustable pointer into place.

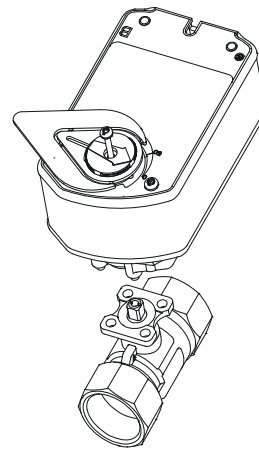


Figure 15: Mount the Actuator

Manual Override

Use only the supplied manual override crank to reposition the actuator hub when using the manual override feature.

IMPORTANT: Applying excessive torque to the manual override or operating the manual override with a power tool may damage the internal components of the actuator and cause premature failure.

To reposition the actuator hub, proceed as follows:

1. De-energize the actuator.
2. Insert the hex end of the manual override crank into the manual override adjustment point on the face of the actuator.
3. Rotate the manual override crank in the direction indicated by the arrow on the label.

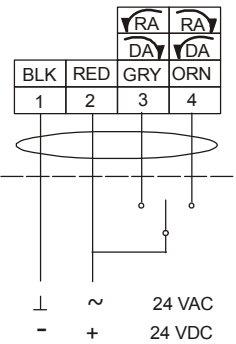
4. The actuator requires 8-1/2 manual override crank rotations from the full spring return position to fully reposition the actuator hub. At the end of travel, the rotation resistance increases. Do not force the manual crank past this point.
5. While holding the manual crank in the wound position, rotate and hold the red lock shaft approximately 10° then release the manual crank to lock the actuator hub in place.

Note: Insert and slightly rotate the manual crank in the direction indicated by the arrow on the label to unlock the actuator hub. Alternately, the actuator hub automatically unlocks when power is applied to the actuator, and returns the actuator to normal drive and spring return operation.

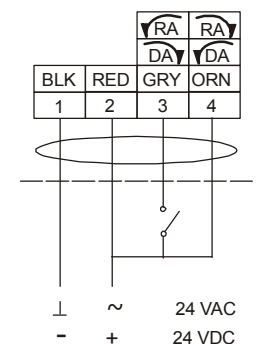
VAS24-70-(T)-T

On/Off and Floating

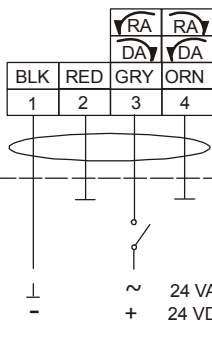
Floating Control, Four Wire



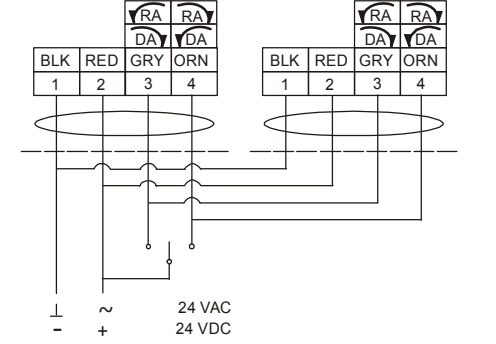
Open/Close, Single Wire Control



On/Off Control, Two Wire



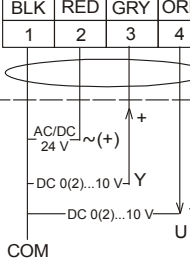
Floating Control, Multiple Actuators with One Transformer



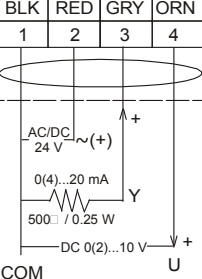
VAMS24-70-T

Modulating

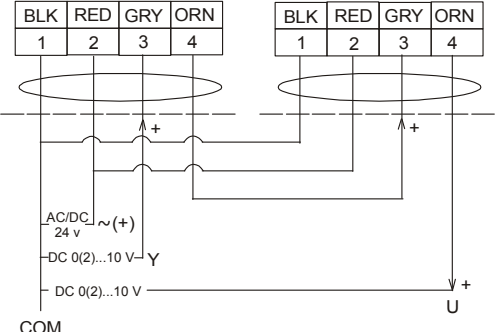
DC 0(2)...10 V Control



0(4)...20 mA Control with External Resistor



Master-Slave Application



WARNING: Risk of Electric Shock. Disconnect or isolate all power supplies before making electrical connections. More than one disconnect or isolation may be required to completely de-energize equipment. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.



CAUTION: Risk of Property Damage. Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.



CAUTION: Risk of Property Damage. Insulate and secure each unused wire lead before applying power to the actuator. Failure to insulate and secure each unused wire lead may result in property damage.



IMPORTANT: Make all wiring connections in accordance with the National Electrical Code and local regulations. Use proper Electrostatic Discharge (ESD) precautions during installation and servicing to avoid damaging the actuator's electronic circuits.

NOTE: **WARNING:** All VA(M)S-70-(T)-T Series actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure. To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall). The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Taco office. Taco shall not be liable for damages resulting from misapplication or misuse of its products.

Using Conduit

All VA(M)S-70-(T)-T Series Actuators accept 3/8 in. (10 mm) trade size flexible metal conduit.

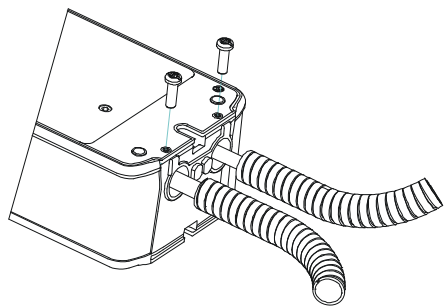


Figure 21: Adding Flexible Metal Conduit

- 1. Feed the actuator cables through the field-supplied conduit.
- 2. Push the conduit into the holes in the actuator and secure it with the supplied 10-32 x 9/16 in. screws, as illustrated in Figure 21. The product label marks the position of holes for the screws. Drive the screws through the product label in the marked positions. Drive the screwhead flush with the plate to secure the conduit.

IMPORTANT: Careful workmanship is required to secure flexible metal conduit. Cut the conduit end perpendicular to its axis. Insert the cut end into the bottom of the holes in the actuator and hold the conduit in place while securing it with the screws provided. Check a completed installation by pulling on the conduit to ensure its retention.

Mode Selection Switch

Actuators have an external mode selection switch to reverse control logic. The switch is accessible from both A and B sides of the actuator as illustrated in Figure 22. Actuators are delivered in Direct Acting (DA) mode and can be switched by the user to Reverse Acting (RA) mode.

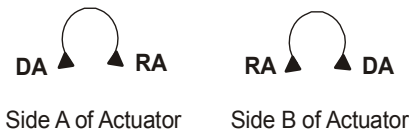


Figure 22: Mode Selection

Control Response

The installation side of the actuator and the position of the mode selection switch combine to determine control response from the actuator. See Figure 23.

Control Inputs		Installation Side			
GRY	ORN	A		B	
3	4	DA	RA	RA	DA
CLOSED	OPEN	↘	↗	↘	↗
OPEN	CLOSED	↗	↘	↗	↘
OPEN	OPEN	STOP	STOP	STOP	STOP
CLOSED	CLOSED	↘	↗	↘	↗

Figure 23: Control Response

LIMITED WARRANTY STATEMENT

Taco, Inc. will repair or replace without charge (at the company's option) any product or part which is proven defective under normal use within five (5) years from the date of manufacture.

In order to obtain service under this warranty, it is the responsibility of the purchaser to promptly notify the local Taco stocking distributor or Taco in writing and promptly deliver the subject product or part, delivery prepaid, to the stocking distributor. For assistance on warranty returns, the purchaser may either contact the local Taco stocking distributor or Taco. If the subject product or part contains no defect as covered in this warranty, the purchaser will be billed for parts and labor charges in effect at time of factory examination and repair.

Any Taco product or part not installed or operated in conformity with Taco instructions or which has been subject to misuse, misapplication, the addition of petroleum-based fluids or certain chemical additives to the systems, or other abuse, will not be covered by this warranty.

If in doubt as to whether a particular substance is suitable for use with a Taco product or part, or for any application restrictions, consult the applicable Taco instruction sheets or contact Taco at [401-942-8000].

Taco reserves the right to provide replacement products and parts which are substantially similar in design and functionally

equivalent to the defective product or part. Taco reserves the right to make changes in details of design, construction, or arrangement of materials of its products without notification.

TACO OFFERS THIS WARRANTY IN LIEU OF ALL OTHER EXPRESS WARRANTIES. ANY WARRANTY IMPLIED BY LAW INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS IS IN EFFECT ONLY FOR THE DURATION OF THE EXPRESS WARRANTY SET FORTH IN THE FIRST PARAGRAPH ABOVE. THE ABOVE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR STATUTORY, OR ANY OTHER WARRANTY OBLIGATION ON THE PART OF TACO.

TACO WILL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF ITS PRODUCTS OR ANY INCIDENTAL COSTS OF REMOVING OR REPLACING DEFECTIVE PRODUCTS.

This warranty gives the purchaser specific rights, and the purchaser may have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts or on the exclusion of incidental or consequential damages, so these limitations or exclusions may not apply to you.



Taco Comfort Solutions® A Taco Family Company

Taco, Inc., 1160 Cranston Street, Cranston, RI 02920 | Tel: (401) 942-8000 | FAX: (401) 942-2360

Taco (Canada), Ltd., 8450 Lawson Road, Suite #3, Milton, Ontario L9T 0J8 | Tel: (905) 564-9422 | FAX: (905) 564-9436

Visit our web site: www.TacoComfort.com | Printed in USA | ©2017 Taco, Inc.

